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EXAMINER	
GUHARAY, KARABI	
ART UNIT	**PAPER NUMBER**
2879	

DATE MAILED: 01/31/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

H·A

Office Action Summary	Application No.	Applicant(s)	
	10/666,236	DERRAA, AMMAR	
	Examiner	Art Unit	
	Karabi Guharay	2879	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *Amendment, filed on 10/14/2005*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-20* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-20* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

Response to Amendment

Amendment, filed on 10/14/2005 has been considered and entered.

Claims 1 & 8 have been amended. Claims 13-20 are added.

Formal drawings, submitted on 10/14/2005 have been acknowledged.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 1-3, 5 and 12 are rejected under 35 U.S.C. 102(b) as being anticipated by Yonezawa et al. (4,561,009) (of record).

Regarding claim 1, Yonezawa discloses a column line structure for a device comprising an elongated conductive structure (Figure 9B, element 32), a resistive layer (33) disposed on a top surface of the elongated conductive structure and extending over at least a portion of one or more side surfaces of the elongated conductive structure, an insulative layer (31) disposed over a top surface of the resistive layer having outer edges (two side edges) substantially aligned with side surfaces of the resistive layer 33 (33 & 31 are exactly aligned, see Fig 9B).

The limitation of the column line structure being for use in a cathode assembly of a field emission device is not given patentable weight as it is restricted to the preamble and there are no structural limitations unique to a field emission device in the body of the claim. Furhermore, the column line structure disclosed by Yonezawa is capable of

being used in a field emission device.

Regarding claims 2 and 3, the elongated conductive structure comprises a metal such as aluminum (column 1, line 46).

Regarding claim 5, the insulative layer (31) comprises silicon oxide (column 5, line 39).

Regarding claim 12, the resistive layer (33) is disposed directly on the top surface of the elongated conductive structure (32).

Claims 8 -11 are rejected under 35 U.S.C. 102(b) as being anticipated by Shen et al (US 5,594,297)

Regarding claim 8, Shen discloses a field emission device comprising a cathode assembly and an anode assembly (column 1, line 60) assembled together, wherein the cathode assembly includes an addressing matrix comprising multiple row lines (Figure 2, element 60) elevationally disposed above column lines (20), the column lines having an insulating layer (70) disposed over a top surface of the column lines wherein the insulating layer (70) substantially exactly overlies the column lines (since insulating layer 70 is positioned exactly overlying the column lines).

Regarding claim 9, Shen et al. disclose that the column lines include at least one conductive layer (20) and a resistive layer (40) disposed over at least a top surface of the conductive layer.

Regarding claim 10, Shen et al. disclose that the resistive layer (40) extends over at least a portion of at least one side surface of the conductive layer.

Regarding claim 11, Shen et al. disclose that the resistive layer (40) extends over opposing side surfaces of the conductive layer.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claim 6 is rejected under 35 U.S.C. 103(a) as being unpatentable over Yonezawa et al. (4,561,009) (of record) in view of Garcia (5,521,461) (of record).

Yonezawa discloses a column line structure capable of being used in a field emission device, comprising an elongated conductive structure (Figure 9B, element 32), a resistive layer (33) disposed on a top surface of the elongated conductive structure and extending over at least a portion of one or more side surfaces of the elongated conductive structure, an insulative layer (31) disposed over a top surface of the resistive layer and having side surfaces substantially coincident with side surfaces of the resistive layer. The insulative layer (31) of Yonezawa may comprise silicon oxide (column 5, line 39).

Yonezawa fails to exemplify an insulative layer of silicon nitride. Garcia teaches an insulating layer for an FED being made of either silicon oxide or silicon nitride (column 3, lines 46-47), and therefore teaches that the two materials are interchangeable. Therefore regarding claim 6, it would have been obvious to one of ordinary skill in the art at the time of the invention to modify the column line structure of

Yonezawa to have an insulative layer made of silicon nitride, as Garcia has taught silicon nitride to be interchangeable with silicon oxide.

Claim 7 is rejected under 35 U.S.C. 103(a) as being unpatentable over Yonezawa et al. (4,561,009) (of record) in view of Busta et al. (4,855,636).

Yonezawa discloses a column line structure capable of being used in a field emission device, comprising an elongated conductive structure (Figure 9B, element 32), a resistive layer (33) disposed on a top surface of the elongated conductive structure and extending over at least a portion of one or more side surfaces of the elongated conductive structure, an insulative layer (31) disposed over a top surface of the resistive layer and having side surfaces substantially coincident with side surfaces of the resistive layer. Yonezawa discloses that the alumina layer preferably be kept as thin as 1000 Angstroms (column 2, line 49).

Yonezawa fails to exemplify the thickness of the insulative layer.
Busta teaches an insulating layer for semiconductive emissive device being 1000 angstroms in thickness (column 5, lines 36-38).
Therefore regarding claim 7, it would have been obvious to one of ordinary skill in the art at the time of the invention to modify the column line structure of Yonezawa to have an insulative layer of about 1000 angstroms in thickness, as Busta has taught such a thickness to provide adequate insulation in a semiconductive device, in order to keep the device as thin as possible.

Claims 1-2, 4-5 and 8-17 & 20 are rejected under 35 U.S.C. 103(a) as being

unpatentable over the applicant's admission of the prior art.

Regarding claims 1 & 13, the applicant's admission of the prior art teaches a field emission device (Fig 1) comprising a plurality of column line structures (14) comprising an elongated conductive structure, a resistive layer (15) disposed on a top surface of the elongated conductive structure (14) and extending over at least a portion of one or more side surfaces of the elongated conductive structure, a dielectric, or insulative, layer (20) disposed over a top surface of the resistive layer and having outer edges substantially aligned with side surfaces of the resistive layer, and a dielectric layer (in this case glass base plate 12) disposed over at least portions of the plurality of column line structure as claimed in claim 13.

Therefore it would have been obvious to one of ordinary skill in the art at the time of the invention to provide a column line structure for a field emission device having the structure taught by the applicant's admission of the prior art.

Regarding claims 2 & 14, the elongated conductive structure comprises a metal (page 1, line 24).

Regarding claim 15, though Applicant's admitted prior art is silent about the particular metal, aluminum is well known as being suitable metal for cathode in a field emission device. Thus it would have been obvious to one having ordinary skill in the art at the time the invention was made to use aluminum as the metal material for the cathode line, since selection of known material for known purpose is within the skill of art.

Regarding claims 4 & 16, the resistive layer (15) may comprise silicon (page 2, line 3).

Regarding claims 5 & 17, the insulative layer (20) comprises silicon oxide (page 2, lines10-1 1).

Regarding claims 12 & 20, the resistive layer (15) is disposed directly on the top surface of the elongated structure (14).

Regarding claim 8, the applicant's admission of the prior art teaches a field emission device comprising a cathode assembly and an anode assembly (Figure 1) assembled together, wherein the cathode assembly includes an addressing matrix comprising multiple row lines (22) elevationally disposed above column lines (14), the column lines having an insulating layer (20) disposed over a top surface of the column lines and wherein the insulating layer (20) substantially exactly overlies the column lines (14).

Therefore it would have been obvious to one of ordinary skill in the art at the time of the invention to provide a field emission device having the structure taught by the applicant's admission of the prior art.

Regarding claim 9, the column lines include at least one conductive layer (14) and a resistive layer (15) disposed over at least a top surface of the conductive layer.

Regarding claim 10, the resistive layer (15) extends over at least a portion of at least one side surface of the conductive layer (14).

Regarding claim 11, the resistive layer (15) extends over opposing side surfaces of the conductive layer (14).

Claims 6 & 18 are rejected under 35 U.S.C. 103(a) as being unpatentable over the applicant's admission of the prior art in view of Garcia (5,521,461) (of record).

The applicant's admission of the prior art teaches a column line structure for a field emission device comprising an elongated conductive structure (Figure 1, element 14), a resistive layer (15) disposed on a top surface of the elongated conductive structure and extending over at least a portion of one or more side surfaces of the elongated conductive structure, a dielectric, or insulative layer (20) disposed over a top surface of the resistive layer and having side surfaces substantially coincident with side surfaces of the resistive layer. The insulative layer (20) may comprise silicon oxide (page 2, lines 10-1 1).

The applicant's admission of the prior art fails to exemplify an insulative layer of silicon nitride.

Garcia teaches an insulating layer for an FED being made of either silicon oxide or silicon nitride (column 3, lines 46-47), and therefore teaches that the two materials are interchangeable.

Therefore regarding claims 6 & 18, It would have been obvious to one of ordinary skill in the art at the time of the invention to modify the column line structure of the applicant's admission of the prior ad to have an insulative layer made of silicon nitride, as Garcia has taught silicon nitride to be interchangeable with silicon oxide.

Claims 7 & 19 are rejected under 35 U.S.C. 103(a) as being unpatentable over Appicant's admitted prior art in view of Busta et al. (4,855,636).

The applicant's admission of the prior art teaches a column line structure for a field emission device comprising an elongated conductive structure (Figure 1, element 14), a resistive layer (15) disposed on a top surface of the elongated conductive structure and extending over at least a portion of one or more side surfaces of the elongated conductive structure, a dielectric, or insulative layer (20) disposed over a top surface of the resistive layer and having side surfaces substantially coincident with side surfaces of the resistive layer.

Applicant's admission of prior art fails to exemplify the thickness of the insulative layer.

However, Busta teaches an insulating layer for semiconductive emissive device being 1000 angstroms in thickness (column 5, lines 36-38).

Therefore regarding claims 7 & 19, it would have been obvious to one of ordinary skill in the art at the time of the invention to modify the column line structure of applicant's submission of prior art structure to have an insulative layer of about 1000 angstroms in thickness, as Busta has taught such a thickness to provide adequate insulation in a semiconductive device, in order to keep the device as thin as possible.

Response to Arguments

Applicant's arguments filed on 10/14/2005 have been fully considered but they are not persuasive.

(1) Applicant contends that Fig 9B of Yonezawa does not teach outer edges of the insulative layer are aligned with side surfaces of the resistive layer

Examiner respectfully disagrees, since both layer 33 and layer 31 at one side (the side exposing conductive layer (32) are aligned which is clearly shown in Fig 9B, and since layer 31 extend over the entire expanse of layer 33 (as admitted by applicant), other side edge is also aligned.

(2) In response to applicant's argument regarding rejection of claim 8 with the prior art of Shen et al, examiner respectfully presents that applicant's new limitation of insulating layer substantially exactly overlies the column lines does not obviate the rejection of claim 8. Though the lateral dimension of insulating layer is greater than column lines, the insulating layer of Shen exactly overlies the column lines.

(3) In response to applicant's argument regarding Applicant's admitted prior art, examiner points out that outer edge of resistive layer 15 and the edge of the dielectric layer 20 (since dielectric layer 20 is disposed on the resistive layer and base of the dielectric 20 is same as the base area of resistive layer 15) are aligned.

Conclusion

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the

shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Contact Information

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Karabi Guharay whose telephone number is (571) 272-2452. The examiner can normally be reached on Monday-Friday 8:30 am - 5:00 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Nimeshkumar D. Patel can be reached on (571) 272-2457. The fax phone number for the organization is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Karabi Guharay

Karabi Guharay
Primary Examiner
Art Unit 2879